

Exposure Control Plan – Methylene Chloride


Principal Investigator/Laboratory Manager:	Date:
Lab Personnel Name(s):	
Building:	Lab Number(s):
Description of Experiment or Procedure:	

INTRODUCTION

Methylene chloride (CAS # 75-09-2) is a clear, colorless liquid with a sweet, chloroform-like odor. It is volatile, slightly soluble in water, and miscible with most organic solvents. It is also referred to as dichloromethane (DCM), methylene dichloride, or methylene bichloride. This exposure control plan applies to all forms of methylene chloride at greater than 0.1% by weight, including the deuterated form (CAS # 1665-00-5).

Methylene chloride is commonly used as a solvent, reagent, analytical standard, or other experimental substance in laboratories for chemical analysis, chemical synthesis, instrument calibration, dissolving other substances, extracting and purifying other chemicals, and other uses in research and development.

Inhaling the vapor may cause mental confusion, light-headedness, nausea, vomiting, and headache. Continued exposure may cause increased staggering, unconsciousness, and even death. High vapor concentrations may cause irritation of the eyes and respiratory tract. Long term exposure has been linked to cancer.

CHEMICAL	GHS PICTOGRAMS	HAZARDS
Methylene Chloride		<p>Acute Effects: Eye irritant, skin irritant, drowsiness or dizziness (Central Nervous System)</p> <p>Chronic Effects: Suspected carcinogen, damage to organs (Liver, Kidneys, Blood)</p>

OCCUPATIONAL EXPOSURE LIMITS

EPA Exposure Limit	Concentration
Action Level (Based on an 8-hour Time Weighted Average)	1 ppm (4 mg/m ³)
Existing Chemical Exposure Limit (ECEL) (Based on an 8-hour Time Weighted Average)	2 ppm (8 mg/m ³)

Short Term Exposure Limit (STEL) – 15 minutes	16 ppm (57 mg/m ³)
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SECTION 1. TRAINING REQUIREMENTS

TRAINING DOCUMENTATION	YES	NO
Have lab personnel completed Lab Safety and Chemical Waste Management training in the last year and all other required EHS trainings? Lab personnel can check their training history in HuskySMS . *Lab personnel must complete all required EHS trainings prior to working with methylene chloride.	<input type="checkbox"/>	<input type="checkbox"/>

SECTION 2. ADMINISTRATIVE CONTROLS

Work Practices	Yes	No
Has the principal investigator (PI)/laboratory manager approved lab personnel to work alone with methylene chloride?	<input type="checkbox"/>	<input type="checkbox"/>
Has the safety data sheet (SDS) for methylene chloride been reviewed by lab personnel?	<input type="checkbox"/>	<input type="checkbox"/>
Have lab personnel substituted or reduced the quantity of methylene chloride, if possible?	<input type="checkbox"/>	<input type="checkbox"/>
If substitution or quantity reduction of methylene chloride is not feasible, please explain why:	<i>Write why methylene chloride must be in the lab over other options.</i>	

SECTION 3. INITIAL AND PERIODIC MONITORING

The EPA requires exposure monitoring to ensure all individuals working with methylene chloride are not being exposed at or above the EPA ECEL and STEL. Prior to beginning operations involving methylene chloride or modifying existing operations in any manner that may increase exposure, lab personnel must notify EHS to perform an exposure assessment.

Monitoring Date:		Sample Analysis Lab:	
Write the results (ppm or mg/m ³) of the methylene chloride monitoring?			<i>Write result in ppm or mg/m³</i>
Did the results of the monitoring exceed the Action Level (1ppm), ECEL (2ppm) or STEL (16ppm)?			<i>Write Yes or No</i>
What is the next periodic monitoring requirement (Review the table below to find the requirement)?			<i>Write Date</i>
Air Concentration Requirement	Periodic Monitoring Requirement		
1. The initial exposure monitoring concentration is below the ECEL action level and at or below the EPA STEL.	ECEL and EPA STEL periodic monitoring at least once every 5 years.		
2. The initial exposure monitoring concentration is below the ECEL action level and above the EPA STEL.	ECEL periodic monitoring at least once every 5 years AND EPA STEL periodic monitoring is required every 3 months.		

3. The initial exposure monitoring concentration is at or above the ECEL action level and at or below the ECEL; and at or below the EPA STEL.	ECEL monitoring every 6 months
4. The initial exposure monitoring concentration is at or above the ECEL action level and at or below the ECEL; and above the EPA STEL.	ECEL periodic monitoring every 6 months AND EPA STEL periodic monitoring every 3 months.
5. The initial exposure monitoring concentration is above the ECEL and below, at, or above the EPA STEL.	ECEL periodic monitoring every 3 months AND EPA STEL periodic monitoring every 3 months.

SECTION 4. REGULATED AREA

A **Regulated Area** distinguishes places where airborne concentrations of methylene chloride exceed, or there is a reasonable possibility they may exceed, the applicable EPA Existing Chemical Exposure Limit (ECEL) and short-term exposure limit (STEL). The principal investigator or laboratory manager must establish and mark the regulated area.

Work Practices	Yes	No
Has a regulated area been established for methylene chloride? If so, write the location(s) in the lab: _____	<input type="checkbox"/>	<input type="checkbox"/>
Has the regulated area been marked with adequate signage and/or boundaries?	<input type="checkbox"/>	<input type="checkbox"/>
Is access to the regulated area restricted to lab personnel without proper training or personal protective equipment?	<input type="checkbox"/>	<input type="checkbox"/>

List all lab personnel with access to the Regulated Area:

SECTION 5. ENGINEERING CONTROLS

- Chemical Fume Hood
 Local Exhaust (e.g., snorkels)
- Glove Box
 Other _____

Work Practices	Yes	No	NA
Is the chemical fume hood(s) running between 80-120 linear feet/minute and tested by EHS within the last year?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have the glove box, local exhaust ventilation, or other control device been tested and running within manufacturer's specifications?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have lab personnel been trained to ensure the selected engineering control is being properly used, maintained, and decontaminated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If an engineering control method is not selected, the PI/laboratory manager must document why these are not feasible, not effective, or otherwise not implemented:	<i>Describe why engineering controls are not selected here (if applicable).</i>
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SECTION 6. WORK PRACTICE CONTROLS

Work Practices	Yes	No
Have all secondary containers been labeled with the chemical name and hazard classes?	<input type="checkbox"/>	<input type="checkbox"/>
Are all original containers and secondary containers tightly sealed when not in use?	<input type="checkbox"/>	<input type="checkbox"/>
Have smaller stock containers of methylene chloride been purchased to reduce exposure?	<input type="checkbox"/>	<input type="checkbox"/>
Is methylene chloride stored away from strong oxidizers, strong acids, metals, amines, ignition sources, and other incompatible chemicals?	<input type="checkbox"/>	<input type="checkbox"/>
Is methylene chloride transported in secondary containment, preferably composed of polyethylene or another compatible material?	<input type="checkbox"/>	<input type="checkbox"/>
Are storage and work areas with methylene chloride kept clean, orderly, and in a sanitary condition?	<input type="checkbox"/>	<input type="checkbox"/>
Do lab personnel wash hands thoroughly with soap and water before and after handling methylene chloride and prior to exiting the lab?	<input type="checkbox"/>	<input type="checkbox"/>

SECTION 7. PERSONAL PROTECTIVE EQUIPMENT (Select all that apply)

Body Part	Personal Protective Equipment	
<input type="checkbox"/> Eye and Face Protection	<input type="checkbox"/> Safety goggles <input type="checkbox"/> Safety glasses	<input type="checkbox"/> Face shield <input type="checkbox"/> Other _____
<input type="checkbox"/> Hand Protection	Inner Glove (Required)	Outer Glove (Recommended)
	<input type="checkbox"/> Polyethylene/ethylene vinyl alcohol (PE/EVOH) <input type="checkbox"/> Polyethylene vinyl alcohol and ethylene vinyl alcohol (PVA/EVA) <input type="checkbox"/> Polyvinyl alcohol (PVA) <input type="checkbox"/> Viton®/Butyl Polymer <input type="checkbox"/> Other _____	<input type="checkbox"/> Nitrile <input type="checkbox"/> Neoprene <input type="checkbox"/> Other _____
Note: The PI or laboratory manager must ensure that the glove or combination of gloves being used is compatible with methylene chloride and all other chemicals being used in the procedures or experiments.		

<input type="checkbox"/> Body Protection	<input type="checkbox"/> Lab coat <input type="checkbox"/> Long pants	<input type="checkbox"/> Plastic or rubber apron <input type="checkbox"/> Other _____
<input type="checkbox"/> Foot Protection	<input type="checkbox"/> Closed-toed footwear <input type="checkbox"/> Other _____	
<input type="checkbox"/> Respiratory Protection	<input type="checkbox"/> Supplied air respirator <input type="checkbox"/> Self-Contained Breathing Apparatus (SCBA) <input type="checkbox"/> Not applicable	
<input type="checkbox"/> Hearing Protection	<input type="checkbox"/> Ear plugs <input type="checkbox"/> Earmuffs	<input type="checkbox"/> Not applicable <input type="checkbox"/> Other _____
<input type="checkbox"/> Other	<i>Please write in other required personal protective equipment (if applicable)</i>	

SECTION 8. EMERGENCY PROCEDURES

1. Relocate to a safe location. Close door(s) to lab.
2. Call **911**.
3. If safe, post a "NO ENTRY" sign(s) or other warning information on the door(s).
4. Evacuate the building through the nearest exit. Do not run. Do not use elevators.
5. Do not re-enter area until instructed to do so by the UConn Fire Department or other emergency personnel.
6. Report the accident to the principal investigator/laboratory manager.

SECTION 9. FIRST AID PROCEDURES

First Aid- Eyes	<ol style="list-style-type: none"> 1. Move to the eyewash, forcibly hold eyelids open and begin flushing both eyes with water. 2. Remove contact lenses and eyewear while flushing (if applicable). 3. Dial 911 or have someone else dial 911. 4. Keep flushing eyes under the eyewash until emergency personnel arrive. 5. Report incident to the PI/laboratory manager and EHS.
First Aid - Ingestion	<ol style="list-style-type: none"> 1. Immediately rinse the mouth with water and then drink water (two glasses at most). Do NOT induce vomiting. 2. Have another person from the lab dial 911. 3. Report incident to the PI/laboratory manager and EHS.
First Aid- Inhalation	<ol style="list-style-type: none"> 1. Move to fresh air. 2. Dial 911 or have someone else dial 911. 3. Report incident to the PI/laboratory manager and EHS.

First Aid- Skin	<ol style="list-style-type: none"> 1. Move to safety shower, pull shower handle, and flush affected area with water. 2. Remove contaminated clothing while flushing (if applicable). Do not pull clothes overhead. 3. Dial 911 or have someone else dial 911. 4. Keep rinsing affected area until emergency personnel arrive. 5. Report incident to the PI/laboratory manager and EHS.
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SECTION 10. REGULATED WASTE MANAGEMENT PROCEDURES (Select and describe waste management practices.)

- All methylene chloride waste, including gloves contaminated with methylene chloride, must be labeled with a “Hazardous Waste” sticker or tag, use full chemical names to describe the waste (i.e., no chemical abbreviations or symbols), be stored in sturdy, plastic containers with tight-fitting caps or lids, and be stored alone or with other compatible chemicals.
- Hazardous wastes with methylene chloride must be stored at or near a green “Satellite Accumulation Area” sign prior to pick-up and disposal by **EHS**.

SECTION 11. DECONTAMINATION PROCEDURES

Work Areas	<i>Describe how lab personnel will decontaminate equipment, glassware, and work areas following the usage of methylene chloride.</i>
Personal Hygiene	<i>Describe the personal hygiene practices lab personnel must use following the usage of methylene chloride (e.g., proper handwashing techniques, proper removal of gloves, etc.).</i>

SECTION 12A. LAB PERSONNEL APPROVAL

I have reviewed and will follow the requirements in this lab-specific exposure control plan (ECP) for methylene chloride. I understand that further approval from the PI/Laboratory Manager is required if any of the following events occur:

- *A change in the amount of methylene chloride in the procedure is planned.*
- *A change in the agreed-upon experimental set-up is planned.*
- *Signs of a failure in safety design or equipment are observed.*
- *Signs or symptoms of a chemical exposure are observed.*
- *Unexpected and/or potentially dangerous experimental results occur (e.g., fire, uncontrolled buildup of heat and/or pressure).*

Lab Personnel Name (Print)	Net ID	Date	Signature

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SECTION 12B. PRINCIPAL INVESTIGATOR/LABORATORY MANAGER APPROVAL

I approve of the contents of this lab-specific exposure control plan for methylene chloride. I also agree to review and update the exposure control plan to ensure the effectiveness of the exposure controls, identify any updates, and confirm that all persons are properly implementing the exposure controls.

Principal Investigator/Laboratory Manager Name (Print)	Date	Signature

A HARD OR ELECTRONIC COPY OF THE ECP MUST BE READILY AVAILBALE IN THE LAB.